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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,391	07/18/2003	Jonathan E. Ricketts	14832	4623

28813 7590 08/11/2006

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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/623,391	Applicant(s) RICKETTS ET AL.	
	Examiner Christopher Verdier	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Applicant's Amendment dated May 22, 2006 has been carefully considered but is non-persuasive. Claims 1-19 are pending. The specification has been amended to correct the informality set forth in the first Office action. Correction of this matter is appreciated.

With regard to the objection to the specification as failing to provide proper antecedent basis for the claimed subject matter of claims 6, 12, and 19, which originally recited "at least the grooves of a center one of the mounting members being adapted for receiving and holding alternating ones of the blades extending in opposite directions.", applicant has amended each of these claims to recite "at least the grooves of the fan blade mounting member at the middle of the fan being adapted for receiving and holding alternating ones of the blades extending in opposite directions.", and has argued that support for these amended claims is provided on page 5, lines 2-7 of the specification. This argument is not persuasive, because neither this portion of the specification, nor any other portions of the specification contain the language "at least the grooves of the fan blade mounting member at the middle of the fan being adapted for receiving and holding alternating ones of the blades extending in opposite directions."

Applicant has amended independent claims 1, 7, and 14 to recite that the about 28 degree angle is defined as the angle between the tangent of the outer blade edge relative to the tangent of the fan diameter (claim 1), and that the about 28 degree angle is oriented to a line tangent to an outer blade edge of the radial outer end portion (claims 7 and 14), and has argued that this defines over Yamamoto 4,014,625 and Kinsworthy 3,251,540. These arguments are not persuasive because this amendment adds new matter to the claims. The original specification

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and claims are directed to the radial outer end portion (and not the outer blade edge), being at an about 28 degree angle to a line tangent to the fan diameter at the radial outer end portion (see original claims 1, 7, and 14, and the specification, page 5, lines 26-32, for example). Yamamoto (figures 2 and 15) discloses that the unnumbered fan blades having radial outer end portions near $\beta 2$ defining an outer diameter of the fan, radial inner end portions near $\beta 1$ opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 45 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion. Kinsworthy discloses that the fan blades having radial outer end portions 76 defining an outer diameter of the fan, radial inner end portions 78 opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 30 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion.

Applicant's arguments with regard to the various combinations of Konno 5,827,046 and either (Yamamoto 4,014,625 or Kinsworthy 3,251,540) are the same as set forth above, and are not persuasive for the reasons set forth above.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Amended claims 6, 12, and 19 recite “at least the grooves of the fan blade mounting member at the middle of the fan being adapted for receiving and holding alternating ones of the blades extending in opposite directions.” There is no antecedent basis in the specification for the underlined limitation.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 has been amended to recite that the about 28 degree angle is “defined as the angle between the tangent of the outer blade edge relative to the tangent of the fan diameter”. This adds new matter, because the original specification and original claim 1 are limited to the radial outer end portion (and not the outer blade edge), being at an about 28 degree angle to a line tangent to the fan diameter at the radial outer end portion (see original claim 1, and the

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specification, page 5, lines 26-32, for example). In other words, as seen in figure 5 of the present application, each fan blade 22 has the radial outer end portion 34 (and not the outer blade edge) being at an about 28 degree angle C to a line tangent to the fan diameter at the radial outer end portion. Claim 7 has been amended to recite that the about 28 degree angle is an angle oriented to a line tangent to “an outer blade edge” of the radial outer end portion. Claim 14 has been amended to recite that the about 28 degree angle is an angle oriented to a line tangent to “an outer blade edge” of the radial outer end portion. This amendment to claim 7 and 14 adds new matter, because the original specification and original claims 7 and 14 are limited to the radial outer end portion (and not the outer blade edge), being at an about 28 degree angle to a line tangent to the fan diameter at the radial outer end portion (see original claim 1, and the specification, page 5, lines 26-32, for example). In other words, as seen in figure 5 of the present application, each fan blade 22 has the radial outer end portion 34 (and not the outer blade edge) being at an about 28 degree angle C to a line tangent to the fan diameter at the radial outer end portion.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 has been amended to recite that the about 28 degree angle is “defined as the angle between the tangent of the outer blade edge relative to the tangent of the fan diameter”. This is inaccurate, because the original specification and original claim 1 are limited to the radial

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outer end portion (and not the outer blade edge), being at an about 28 degree angle to a line tangent to the fan diameter at the radial outer end portion (see original claim 1, and the specification, page 5, lines 26-32, for example). In other words, as seen in figure 5 of the present application, each fan blade 22 has the radial outer end portion 34 (and not the outer blade edge) being at an about 28 degree angle C to a line tangent to the fan diameter at the radial outer end portion. Claim 7 has been amended to recite that the about 28 degree angle is an angle oriented to a line tangent to “an outer blade edge” of the radial outer end portion. Claim 14 has been amended to recite that the about 28 degree angle is an angle oriented to a line tangent to “an outer blade edge” of the radial outer end portion. This amendment to claim 7 and 14 is inaccurate, because the original specification and original claims 7 and 14 are limited to the radial outer end portion (and not the outer blade edge), being at an about 28 degree angle to a line tangent to the fan diameter at the radial outer end portion (see original claim 1, and the specification, page 5, lines 26-32, for example). In other words, as seen in figure 5 of the present application, each fan blade 22 has the radial outer end portion 34 (and not the outer blade edge) being at an about 28 degree angle C to a line tangent to the fan diameter at the radial outer end portion.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 7, as far as they are definite and understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto 4,014,625 (figures 2 and 15). Note the cross flow fan comprising a plurality of unnumbered elongate fan blades supported in an axial cylindrical pattern about a rotational axis a of the fan by disk shape fan blade mounting members f located adjacent axial ends of the blades and rotatable about the axis, the fan blades having radial outer end portions near $\beta 2$ defining an outer diameter of the fan, radial inner end portions near $\beta 1$ opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 45 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion and the radial inner end is directed radially inwardly directly toward the axis, with the radial inner end oriented such that a line tangent thereto passes through the axis a at center O . The recitation in claim 1, lines 1-2 of "for a cleaning system of an agricultural combine", and the recitation in claim 7, lines 1-3 of "for an agricultural combine for generating and directing a flow of air to a cleaning system of the combine" are recitations of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Claim 1, as far as it is definite and understood, is also rejected under 35 U.S.C. 102(b) as being anticipated by Kinsworthy 3,251,540. Note the cross flow fan comprising a plurality of elongate fan blades 22 supported in an axial cylindrical pattern about an unnumbered rotational

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axis of the fan by disk shape fan blade mounting members 65 located adjacent axial ends of the blades and rotatable about the axis, the fan blades having radial outer end portions 76 defining an outer diameter of the fan, radial inner end portions 78 opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 30 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion and the radial inner end is directed radially inwardly directly toward the axis. The recitation in claim 1, lines 1-2 of "for a cleaning system of an agricultural combine" is a recitation of intended use as set forth above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-5, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over either (Yamamoto 4,014,625) or (Kinsworthy 3,251,540). Yamamoto and Kinsworthy disclose cross flow fans substantially as claimed as set forth above including fan blades, but do not disclose that the radial outer end portions of adjacent ones of the fan blades are spaced apart by between about 2.3 and 2.4 inches (claim 2), do not disclose that the radial inner end portions of adjacent ones of the fan blades are spaced apart by between about 1.6 and 1.7 inches (claim 3), do not disclose that each fan blade has an overall width as measured between the radial end portions thereof of between about 2.5 and 2.6 inches (claim 4), and do not disclose that the curved intermediate portion of each of the fan blades have a radius of curvature of between about 2.0 and 2.1 inches (claim 5).

The recitation of the specific spacing between radial outer end portions of adjacent ones of the fan blades, the recitation of the specific spacing between the radial inner end portions of adjacent ones of the fan blades, the recitation of the specific fan blade overall width as measured between the radial end portions, and the recitation of the specific radius of curvature of the curved intermediate portion of each of the fan blades are deemed to be matters of choice in design. These blade parameters are known in the fan art to be result-effective variables which influence the fan performance and efficiency. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select and optimize specific

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values for these blade parameters in the cross flow fans of either Yamamoto or Kinsworthy, such that the radial outer end portions of adjacent ones of the fan blades are spaced apart by between about 2.3 and 2.4 inches, such that the radial inner end portions of adjacent ones of the fan blades are spaced apart by between about 1.6 and 1.7 inches, such that each fan blade has an overall width as measured between the radial end portions thereof of between about 2.5 and 2.6 inches, and such that the curved intermediate portion of each of the fan blades have a radius of curvature of between about 2.0 and 2.1 inches, for the purpose of optimizing the fan performance and efficiency, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that discovering the optimum or workable ranges by routine experimentation is not inventive (*In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Claims 8-11 and 13-18, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto 4,014,625. Yamamoto discloses a cross flow fan substantially as claimed as set forth above including fan blades, but does not disclose that the radial outer end portions of adjacent ones of the fan blades are spaced apart by between about 2.3 and 2.4 inches (claims 8 and 15), does not disclose that the radial inner end portions of adjacent ones of the fan blades are spaced apart by between about 1.6 and 1.7 inches (claims 9 and 16), does not disclose that each fan blade has an overall width as measured between the radial end portions thereof of between about 2.5 and 2.6 inches (claims 10 and 17), does not disclose that the curved intermediate portion of each of the fan blades have a radius of curvature

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of between about 2.0 and 2.1 inches (claims 11 and 18), and does not disclose that the fan has a diameter of from about 15 to about 16 inches (claims 13 and 14).

The recitation of the specific spacing between radial outer end portions of adjacent ones of the fan blades, the recitation of the specific spacing between the radial inner end portions of adjacent ones of the fan blades, the recitation of the specific fan blade overall width as measured between the radial end portions, the recitation of the specific radius of curvature of the curved intermediate portion of each of the fan blades, and the recitation of the specific fan diameter are deemed to be matters of choice in design. These blade parameters are known in the fan art to be result-effective variables which influence the fan performance and efficiency. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select and optimize specific values for these blade parameters in the cross flow fan of Yamamoto, such that the radial outer end portions of adjacent ones of the fan blades are spaced apart by between about 2.3 and 2.4 inches, such that the radial inner end portions of adjacent ones of the fan blades are spaced apart by between about 1.6 and 1.7 inches, such that each fan blade has an overall width as measured between the radial end portions thereof of between about 2.5 and 2.6 inches, such that the curved intermediate portion of each of the fan blades have a radius of curvature of between about 2.0 and 2.1 inches, and such that the fan has a diameter of between about 15 and 16 inches, for the purpose of optimizing the fan performance and efficiency, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that discovering the optimum or workable ranges by routine

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experimentation is not inventive (*In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)). The recitation in claim 14, lines 1-3 of “for an agricultural combine for generating and directing a flow of air to a cleaning system of the combine” is a recitation of intended use as set forth above.

Claims 1 and 6, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Konno 5,827,046 in view of either (Yamamoto 4,014,625 or Kinsworthy 3,251,540). Konno (figures 1-2) discloses a cross flow fan 21 substantially as claimed comprising a plurality of elongate fan blades 24 supported in an axial cylindrical pattern about a rotational axis O of the fan by disk shape fan blade mounting members 22, 23, 25 located adjacent axial ends of the blades and rotatable about the axis, the fan blades having unnumbered radial outer end portions defining an outer diameter of the fan, and unnumbered radial inner end portions opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, with the radial inner ends being directed radially inwardly directly toward the axis, with the disk shape fan blade mounting members including axially facing curved grooves 22a, 25a for receiving and holding longitudinal ends of the fan blades, and with the grooves of all of the mounting members including a center one 25 of the mounting members being adapted for receiving and holding alternating ones of the blades extending in opposite directions. (Note that grooves 22a, 25a are capable of receiving and holding alternating ones of the blades extending in opposite directions and therefore perform this function). The recitation in claim 1, lines 1-2 of “for a cleaning system of an agricultural combine” is a recitation of intended use as set forth above.

However, Konno does not disclose that each of the fan blades is oriented such that the radial outer end portion is at 28 degree angle to a line tangent to the fan diameter at the radial outer end portion.

Yamamoto (figures 2 and 15) shows a cross flow fan comprising a plurality of unnumbered elongate fan blades supported in an axial cylindrical pattern about a rotational axis a of the fan by disk shape fan blade mounting members f located adjacent axial ends of the blades and rotatable about the axis, the fan blades having radial outer end portions near $\beta 2$ defining an outer diameter of the fan, radial inner end portions near $\beta 1$ opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 45 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion, for the purpose of reducing vortex noise.

Kinsworthy shows a cross flow fan comprising a plurality of elongate fan blades 22 supported in an axial cylindrical pattern about an unnumbered rotational axis of the fan by disk shape fan blade mounting members 65 located adjacent axial ends of the blades and rotatable about the axis, the fan blades having radial outer end portions 76 defining an outer diameter of the fan, radial inner end portions 78 opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 30 degree angle (which

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includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end portion, for the purpose of providing for maximum scooping action to draw air inside the fan and to provide smooth outward flow from the fan in the opposite direction.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the fan of Konno such that each of the fan blades is oriented such that the radial outer end portion is at 28 degree angle to a line tangent to the fan diameter at the radial outer end portion, as taught by either Yamamoto or Kinsworthy.

Claims 7, 12, 14, and 19, as far as they are definite and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Konno 5,827,046 in view of Yamamoto 4,014,625. Konno (figures 1-2) discloses a cross flow fan 21 substantially as claimed comprising a plurality of elongate fan blades 24 supported in an axial cylindrical pattern about a rotational axis O of the fan by disk shape fan blade mounting members 22, 23, 25 located adjacent axial ends of the blades and rotatable about the axis, the fan blades having unnumbered radial outer end portions defining an outer diameter of the fan, and unnumbered radial inner end portions opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, with the radial inner ends being directed radially inwardly directly toward the axis, with the disk shape fan blade mounting members including axially facing curved grooves 22a, 25a for receiving and holding longitudinal ends of the fan blades, and with the grooves of all of the mounting members including a center one 25 of the mounting members being adapted for receiving and holding alternating ones of the blades extending in opposite directions. (Note that

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grooves 22a, 25a are capable of receiving and holding alternating ones of the blades extending in opposite directions and therefore perform this function). The recitation in claim 7, lines 1-3 of “for an agricultural combine for generating and directing a flow of air to a cleaning system of the combine” and the recitation in claim 14, lines 1-3 of “for an agricultural combine for generating and directing a flow of air to a cleaning system of the combine” are recitations of intended use as set forth above.

However, Konno does not disclose that each of the fan blades is oriented such that the radial outer end portion is at 28 degree angle to a line tangent to the fan diameter at the radial outer end portion and such that the radial inner end portion is oriented such that a line tangent thereto passes through the axis (claims 7 and 14), and does not disclose that the fan has a diameter of between about 15 and 16 inches (claim 14).

Yamamoto (figures 2 and 15) shows a cross flow fan comprising a plurality of unnumbered elongate fan blades supported in an axial cylindrical pattern about a rotational axis of the fan by disk shape fan blade mounting members f located adjacent axial ends of the blades and rotatable about the axis, the fan blades having radial outer end portions near $\beta 2$ defining an outer diameter of the fan, radial inner end portions near $\beta 1$ opposite the radial outer end portions, and curved intermediate portions between the radial end portions, respectively, wherein each of the fan blades is oriented such that the radial outer end portion is at about a 25 to 45 degree angle (which includes a 28 degree angle) to a line tangent to the fan diameter at the radial outer end

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portion and such that the radial inner end is oriented such that a line tangent thereto passes through the axis a at center O, for the purpose of reducing vortex noise.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the fan of Konno such that each of the fan blades is oriented such that the radial outer end portion is at 28 degree angle to a line tangent to the fan diameter at the radial outer end portion, and such that the radial inner end portion is oriented such that a line tangent thereto passes through the axis, as taught by Yamamoto. The recitation in claim 14 of the fan having a diameter of between about 15 and 16 inches is a matter of choice in design. The fan diameter is known in the fan art to be a result-effective variable which influences the fan performance and efficiency. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select and optimize specific values for the fan blade diameter, such as between about 15 and 16 inches, for the purpose of optimizing the fan performance and efficiency, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that discovering the optimum or workable ranges by routine experimentation is not inventive (*In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Shaver is cited to show a fan wheel with a fan blade radial outer end portion oriented at a 20 to 40 degree angle to a line tangent to the fan diameter at the radial outer end portion. This reference could also have been applied as it anticipates at least claim 1 under 35 U.S.C. 102, but is not applied at this time in order to avoid multiple rejections.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C.V.
August 3, 2006



Christopher Verdier
Primary Examiner
Art Unit 3745